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CHRONICLE OF THE WORLD HEALTH ORGANIZATION

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SCHEDULE OF MEETINGS

8-13 April	**Expert Committee on Yellow Fever Vaccine, Geneva**
25 April-3 May	**Seminar on Mental Health of the Sub-Normal Child, Oslo**
25 April-4 May	**Joint WHO/ILO Seminar on the Nurse in Industry, London**
7-25 May	**Tenth World Health Assembly, Geneva**
27-31 May *	**Twentieth session of the Executive Board, Geneva**
12-15 June	**Sub-Committee on Non-Proprietary Names of the Expert Committee of the International Pharmacopoeia, Geneva**
17-24 June	**FAO/WHO Expert Committee on Food Additives, Geneva**
24-28 June *	**Study Group on Histological definitions of cancer types, Oslo**
27 June-5 July	**Conference on Health Education of the Public, Wiesbaden**
15-20 July	**Expert Committee on Poliomyelitis, Geneva**
25-31 July	**Technical Conference on Insect Resistance**

* Approximate dates

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THE WORK OF WHO: 1956

A Review of the Annual Report of the Director-General

In the Annual Report of the Director-General on the work of the World Health Organization in 1956,[1] which is a comprehensive account of the year's accomplishments, particular emphasis is laid on the eradication of certain communicable diseases—especially malaria—on WHO's role in the development of national health services, and on the "catalytic effect" on national health administrations of the research stimulated, promoted or coordinated by the Organization.

The goal of malaria eradication was set by the Eighth World Health Assembly, and one of WHO's principal concerns in 1956 was further to clarify the ways in which it could most effectively assist governments to that goal. The success of many eradication programmes in the different regions may well depend on the guidance and help WHO is able to provide. Public health techniques are available for the eradication of the endemic treponematoses and smallpox as well, and eradication programmes for these diseases are under way in various parts of the world.

In assisting the development of public health services, WHO is paying increasing attention to the integration of services which might at first sight appear dissimilar or unrelated but which in fact have many points of contact. Joint programmes—in nutrition, maternal and child health, and health education, for example—are being more frequently undertaken and the benefits to be derived from them are becoming more widely recognized.

It is, of course, not only through its stimulation and co-ordination of research that WHO exerts a "catalytic effect" on health work and on national health administrations, but the research activities of the Organization provide a good illustration of this effect. As the Annual Report puts it, the promotion of research "is one of the keystones of WHO's future work" and an essential element in one of the Organization's basic functions, which is the pooling and appraisal of scientific and technical knowledge and the study of its applicability to public health problems. The planning and co-ordination of research gives rise to a stimulating "cross-fertilization" of ideas, and experience has shown that the formulation of sound research programmes evokes increased co-operation and more energetic measures from both individuals and institutions.

The effects of research in which WHO has played a part are felt in a large number of the projects in operation in 1956. A complete list of these projects is given in the Annual Report, constituting a guide to every type of aid provided by the Organization in its efforts to promote better health in all parts of the world.

In addition to giving information on the established pattern of work which has continued throughout 1956, the Annual Report also makes reference to the responsibilities of WHO in a new and challenging field of public health—the peaceful uses of atomic energy. Although the work remains limited in scope, a sound basis now exists for the activities which the Organization will certainly be required to carry out in the future.

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[1] World Health Organization (1957) *The work of WHO, 1956 : annual report of the Director-General to the World Health Assembly and to the United Nations (Off. Rec. Wld Hlth Org.*, 75), Geneva. xi+233 pages. Price: 10/-, $2.00, or Sw. fr. 6.—. Published in English, French, and Spanish.

COMMUNICABLE DISEASES

The year 1956 brought the work of WHO on communicable diseases to a point where past activities could be viewed in perspective and it became possible to " look into the future with the hope that by using similar methods of approach results could be attained in the fight against many communicable diseases as important as those achieved in malaria and endemic treponematoses ".

Three of the communicable diseases—malaria, treponematoses and smallpox—single themselves out for immediate mention by reason of the fact that techniques of eradication are now available for all of them.

Malaria

Two factors have influenced WHO's work in this field over the past year: the increasingly general acceptance of the policy of eradication as advocated by the World Health Assembly, and the development of insecticide resistance by certain malaria vectors. These two factors are interdependent. The development of resistance to the insecticides by the vector has made eradication imperative. In the last eight years the work accomplished with the help of the Organization has shown that " if transmission is interrupted for a sufficient length of time, by breaking the cycle at the level of the vector over a wide enough area, the infection dies out and costly control measures can be replaced by the much cheaper routine supervision. As is well known, the systematic application of residual insecticides made such interruption of transmission possible."

The policy of replacing routine malaria control by malaria eradication was considered technically justifiable by meetings attended by malariologists from many parts of the world and convened during 1956. Their views, and the fact that many governments had accepted the policy, gave cause for encouragement. Although failures had occurred, the Inter-regional Malaria Conference for the Eastern Mediterranean and European Regions believed that these were more likely due to lack of preparation or administrative faults than to technical reasons. Financial limitations also prevented some eradication programmes from being launched, and in this connexion it is stressed that " the Eighth World Health Assembly indicated the solution to such situations by establishing the Malaria Eradication Special Account. Unfortunately the Account has received very little support so far and the meagre funds available are quite inadequate for the purpose ".

In collaboration with the United States Public Health Service National Institutes of Health, WHO made an experimental study of the efficacy of either pyrimethamine or chloroquin mixed with common salt added to the diet as a protection against malaria infection. A number of laboratories in different parts of the world collaborated in the study of insecticide resistance in anophelines and this problem was also studied by the Expert Committee on Insecticides.

WHO personnel were engaged in anti-malaria work in 34 areas in all WHO Regions. New projects were under way in Ethiopia and Sudan. WHO malaria consultants were sent at government request to many countries and territories and three advisory teams were working in the field.

Treponematoses and venereal infections

In the mass campaigns carried out against endemic syphilis and yaws, with assistance from WHO and UNICEF, more than 55 million people had been examined, and 16 million treated, by the end of 1956. Indeed, these endemic treponematoses were the first group of diseases to be controlled by case-finding and treatment. But eradication, as opposed to control, " only became possible when, in the course of WHO-assisted field

studies, it became clear that case-finding was not sufficient and that contacts must also be treated, because they produced a reservoir of infection which would vitiate the results of a mass campaign. Further, unless the search for cases was carried out methodically, house by house and family by family, cases would be missed and sooner or later the infection would again spread. The development of long-acting penicillin preparations and attention to these principles have been shown to make it possible virtually to eradicate these diseases . . . " Nevertheless, despite the success with penicillin treatment, " serious and sometimes fatal hypersensitivity reactions following penicillin therapy have been reported in some countries during the last few years. An inquiry by WHO into the frequency of such reactions suggests that the incidence is not high but may be increasing. In the endemic treponematoses mass campaigns . . . there has been little or no evidence of these reactions, probably because the campaigns have mainly involved rural populations in under-developed areas and especially children not previously exposed to the antibiotics. In urban populations in the same areas, on the other hand, where penicillin is used in adult syphilis and other infectious conditions, serious penicillin reactions have been reported. WHO is therefore co-ordinating research in the laboratory and in the field on the usefulness of penicillin preparations other than PAM, and antibiotics other than penicillin, as public-health weapons against the treponematoses. Efforts are being made to obtain more precise knowledge of the transmission factors and the epidemiological cycle of the endemic treponematoses which may facilitate the establishment of simple barriers against infection."

Dangers inherent in the relaxation of routine surveillance after programmes against *venereal* syphilis were noted in national reports received by WHO during the year. These showed that where there is relaxation in surveillance " an increase in the incidence of early syphilis may be expected ". What must also be taken into account is that, even in the more developed countries, venereal infections cannot be regarded as eliminated so long as important reservoirs of these infections remain in other parts of the world where preventive measures are inadequate. This latter topic was discussed, among others, at the International Symposium on Venereal Diseases and the Treponematoses which was organized jointly by the United States Public Health Service and WHO. The symposium was held in Washington, D.C., in May 1956 and some 500 medical officers from all WHO Regions participated in it.

The WHO Reference Laboratories at Copenhagen and Chamblee, Ga., continued the co-ordination of research into laboratory methods for serum diagnosis of the treponematoses, including research on the use of the more recent treponemal antigens (*Treponema pallidum* immobilization (TPI) and *Treponema pallidum* agglutination (TPA) tests). Participating in these studies were some 30 laboratories in various parts of the world. Co-operation with the International Treponematosis Laboratory Center at Johns Hopkins University, Baltimore, Md., was continued. Combined efforts were made to elucidate the biology of the treponematoses, and a monograph reviewing the Center's investigations on this subject over the last five years was prepared for publication.[1]

Smallpox

It is now possible to eradicate smallpox from a country by using a new stable vaccine produced as a consequence of studies promoted by WHO. Reports on the vaccine have been submitted to the Expert Committee on Biological Standardization for consideration in establishing an international standard. Continuing work on the most stable vaccine showed that after two years' exposure at 45°C it still gave 100% successful vaccinations in man.

It had been known for a long time that eradication of smallpox was possible by

[1] Turner, T. B. & Hollander, D. H. (1957) *Biology of the Treponematoses*, Geneva (*World Health Organization: Monograph Series* No. 35)

means of preventive vaccination. Nevertheless, the disease had persisted in many parts of the world. This was caused primarily by the fact that the usual lymph—the vaccine in general use—rapidly lost its potency in high temperatures, and although more stable dried vaccines had been tried results were often unsatisfactory. In consequence of the development of the new vaccine, which is stable for months in tropical temperatures, eradication programmes have started in some countries, particularly in Latin America.

Zoonoses and veterinary public health

In many under-developed areas brucellosis causes much human sickness and also leads to heavy economic losses in animals and animal products. The control of this disease in sheep and goats is a most important public health problem to which the Organization has given considerable attention. Studies which had been carried out on vaccines and the diagnosis of brucellosis in sheep and goats were discussed in October at a meeting attended by representatives of WHO, FAO, the Department of Bacteriology of the University of California, and the directors of the FOA/WHO Brucellosis Centres in Tunis, Weybridge (England) and Montpellier (France).

In the past year WHO has given assistance to several brucellosis laboratories concerned *inter alia* with diagnostic and chemotherapeutic studies in human beings.

The prospects for rabies control have been considerably improved by certain advances stemming directly from research promoted by the Organization, which has followed two main approaches—the first being to diminish the chances of human infection by immunizing and controlling domestic animals, particularly dogs; and the second to develop better treatment methods. One important advance was the demonstration that the use of hyperimmune serum had a major effect in reducing mortality even after severe bites by rabid wolves. Work is continuing in order to determine the proper dosage and the effect of vaccination in combination with the serum.

WHO gave assistance to the Institut Pasteur in Novi Sad, Yugoslavia, for research on rabies in wild animals, including bats; and work was continued on the development of methods of pre-exposure protection for persons who by their occupation run a severe risk of exposure to rabies.

During the year WHO/FAO Reference Leptospirosis Laboratories were designated in Australia, Japan, the Netherlands, the United Kingdom, and the United States of America. The centres will assist national and other leptospirosis laboratories in carrying out diagnostic procedures, identifying *Leptospira* strains, making surveys in man and animals, and training laboratory workers.

Tuberculosis

Work on tuberculosis has continued along similar lines to those of previous years.[2] In addition, the Organization has extended its studies on diagnostic and control procedures that might usefully be adopted for antituberculosis programmes under primitive conditions. Field research into these problems was planned and co-ordinated by the WHO Tuberculosis Research Office in Copenhagen.

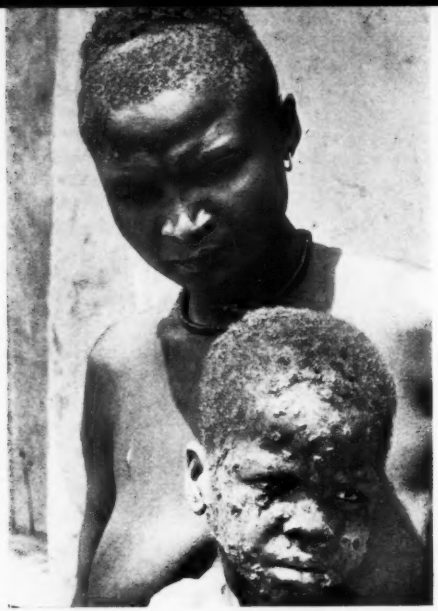
Despite mass BCG vaccination and the considerable progress which has been made in other aspects of tuberculosis control in recent years, the disease remains a serious world problem. The Annual Report analyses the limitations of BCG vaccination in the following terms: "BCG has been, and is being, widely used in joint WHO/UNICEF projects. Recent reports confirm that the principles on which its use is based are sound and that BCG vaccination has a real effect in reducing the incidence of tuberculosis, including the adult type of infectious pulmonary disease. When correctly and widely applied, it will eventually reduce the reservoir of infection in a population; but it is not in itself sufficient to influence the main reservoir of infection which is in already infected persons and to bring tuberculosis under

[2] See *Chron. Wld Hlth Org.*, **10**, 93.

Courses in public health nursing are organized as part of the project for integrated health services in Guatemala. Here, a student taking the first course for teachers lectures to a group of candidates for the auxiliary nursing course

A nurse educator provided by WHO for the General Hospital in Singapore lectures to a class of student nurses

MASS CAMPAIGN AGAINST YAWS
IN NIGERIA



1

2

3

Before treatment the boy's face is covered with many infectious lesions (1). He receives a single dose of long-acting. penicillin (2), and seven days later nearly all the lesions can be seen to have dried (3)

control. It must be combined with a programme of case-finding and treatment."

As the Report goes on to say, " The use of drugs in ambulant persons for therapeutic or prophylactic purposes as a public-health measure has therefore been carefully studied. The control of tuberculosis in vast areas of the world may well depend eventually on the widespread use of one or more cheap drugs that will be easy to produce, to distribute and to take; that will be effective, yet non-toxic." No product has yet been found, or at least none is yet readily available, which meets all these requirements, but isoniazid can be considered the first which does meet some of them. However, in quite a high proportion of cases it has been shown that its effectiveness may be limited by resistance in *M. tuberculosis*. This resistance is less frequent if isoniazid is used in combination with PAS (para-aminosalicylic acid) or streptomycin, but this combined treatment is prejudiced by high costs and the addition of PAS often causes undesirable side-effects. WHO has continued to sponsor the use of isoniazid alone in field studies because it is the only cheap antituberculosis drug now available, it is easy to distribute, and it is readily taken. The Organization continues with the study of various techniques which may prove applicable to particular local conditions so that when more effective products become available control of tuberculosis will be brought within the reach of all countries as quickly as possible.

Poliomyelitis

Dramatic progress has been made in recent years in the development of a vaccine against poliomyelitis and in the possibility of controlling the disease. More than a hundred million doses of the vaccine have been administered with no recurrence of the unfortunate incident of 1955, and the experience gained has shown that vaccination can be effective in reducing the serious consequences of infection. There is, however, still too little knowledge on the part this vaccine should play in controlling the disease, and the question whether it can safely be used during an epidemic is still not finally settled. Intensive study will be required before it can be definitely established whether the present vaccine or the living attenuated virus vaccines, on which intensive work is being done, will provide the solution to these problems. Meanwhile WHO is co-ordinating research and the WHO regional poliomyelitis laboratories have continued to assist national laboratories in studying prevalent viruses and undertaking or assisting in serological surveys.

Trachoma

Interesting new developments in regard to the treatment of trachoma have resulted from studies in Taiwan and Morocco which were assisted by WHO and UNICEF. Where before it was thought that local treatment with antibiotics required repeated applications several times daily over a period of months, it has since become clear that " both the frequency and duration of treatment can be reduced, with a corresponding reduction in cost, and that suitable training of school-teachers and others can make mass treatment a practical proposition." To bring about needed improvements of current methods WHO is promoting epidemiological, virological and therapeutic studies, especially investigations of the associated conjunctivitides which have been shown to play an important part in the evolution of the disease. Trachoma control has now reached a stage more or less comparable to that attained when crystalline penicillin was used against the treponematoses—before the long-acting repository preparations became available. Some of the problems in controlling both diseases are rather similar and their solution in the case of the treponematoses improves the prospect of their solution in trachoma control as well.

Leprosy

The experience gained, and the lessons learned, by WHO in the years of study of the treponemal diseases and tuberculosis have

been made use of and applied in WHO's leprosy control programmes. Prospects for more effective control of this disease have improved following the discovery of the effectiveness of the sulfone drugs against leprosy. But many problems remain to be solved. They include: the determination of the optimum drug preparation; the development of simple case-finding methods and diagnostic techniques; the establishment of criteria of infectivity; and the need to overcome the centuries-old fear of the disease. WHO is developing its leprosy programmes with these objects in view.

Bilharziasis

During 1956 WHO continued to stimulate and encourage research on the identification of intermediate snail hosts and the ecology of the vectors. A detailed knowledge of the ecological factors influencing snail life is essential for the control of the disease by molluscocides, or in attempts to prevent its spread in irrigated areas. A group of specialists concentrated on these problems and recommended guiding lines for the necessary ecological studies. WHO consultants made surveys on the distribution and the socio-economic importance of the disease in Africa and recommended methods of control.

Plague

Work on the epidemiology of wild rodent plague—which has been carried on with WHO assistance for the past three years in Iran, Iraq, Syria, and Turkey—has now been completed. The work plan, which included study of the forms of sylvatic plague prevalent in the four countries, has been described in previous Annual Reports.[3] Two important results of this inter-regional operation have been the organization in the four countries of specialist teams for identifying and controlling outbreaks of plague arising from the areas of endemicity of wild rodent plague, and confirmation of the total absence of species of *Rattus* in the area and the identification of the small burrowing gerbils of the genus *Meriones* as the most important reservoir.

* * *

Studies carried out by the Organization on the communicable diseases have a similar basic approach. The Annual Report shows how each problem is being attacked with analogous methods whatever the disease may be. "The methods of approach adopted in nearly all these studies [on the communicable diseases] follow a similar pattern, which has been developed from experience. At first sight it may seem surprising that the initial steps are often concerned with classification and nomenclature; but it has been found that there may be wide differences of opinion in different parts of the world as to the meaning of a technical term . . . A further step is to develop standards of measurement and methods of using them, so that the results of workers in different countries may be compared and interpreted . . .

"When these and similar basic terms are available, their application in epidemiology and other studies follows. Wide experience of survey techniques in WHO's programmes in malaria, tuberculosis, and the treponematoses has shown that valid results can only be ensured by the most careful planning and attention to statistical requirements; otherwise subsequent evaluation becomes impossible. These principles are now being applied in surveys for various virus diseases, including poliomyelitis. A properly designed survey is expensive and demands highly trained staff that are not easy to find. It has indeed often been found necessary to arrange for special training in the techniques required. A broader approach is therefore being developed which it is hoped will prove both more efficient and more economical. By this method it may be possible to determine the prevalence and distribution of several communicable diseases at the same time at relatively little additional cost . . .

"Experience in WHO's earlier programmes has shown that the application of a new control measure, or the adaptation of an

[3] *Off. Rec. Wld Hlth Org.* **51**, 17; **67**, 13

established technique to different conditions, requires careful pilot studies if success is to be ensured. Furthermore, health authorities need to know what results are likely to be achieved in return for the money and effort expended . . .

" The successful mass application of a communicable-disease control measure may have a large effect on the health services of the country. Many people, particularly in rural areas, are brought into contact with preventive and curative services for the first time, and a demand is created for further services. This requires a broadening of the programme, especially during its consolidation phase, to include measures against other diseases; and this should lead to strengthening of the local health services. The planned use of communicable disease control to this end is being increasingly emphasized by WHO and the most effective ways of doing so are being studied . . .

" Behind all this work there is a fundamental technique without which progress would at best be very slow—the technique of co-ordination of research. Public-health problems are so numerous and facilities for research so limited that, unless the work of the different laboratories and institutions is co-ordinated and co-operative studies planned, unnecessary repetition will greatly delay progress."

PUBLIC HEALTH SERVICES

The general policy of WHO in relation to public health services is well illustrated by the following excerpt from the Annual Report:

" WHO's work on the organization of public-health services is being governed increasingly by the concept of integrated services, as distinct from services separately provided in specific limited fields. Viewed in this light, services which at first sight appear dissimilar or unrelated are seen to have many points of contact and thus to lend themselves to the integrated approach. Joint undertakings—for example, in nutrition, maternal and child health and health education—are becoming more common and the benefits that accrue from them more widely recognized. The concept itself is being broadened; and much attention is being given to social or cultural anthropology and the study of human relationships within the community. The time may not be far off when such subjects will in turn be integrated in the comprehensive health service.

" As the work develops, more emphasis is being placed on the long-term study of important health problems of world-wide significance. Such studies were planned or in progress during the year on a variety of subjects, including the role of the community psychiatric hospital, protein deficiency, the anaemias of pregnancy, the teaching of paediatrics, administrative practices in nursing, and the cost of medical services."

Public health administration

The continuation of work designed to assist governments in establishing decentralized integrated health services, initially for a district or province but ultimately covering the whole country, constituted an important part of WHO's work in public health administration in 1956. Experience had shown that " isolated health projects are of doubtful and transient value unless in the country concerned they are based on a structure of decentralized integrated health services, in which curative and preventive services are organized in hospitals, laboratories and health units well distributed in the cities, towns and villages. These services must be supported by the population and guided by a competent central health authority ".

Examples of WHO-assisted pilot projects designed to bring this about were the development of comprehensive health services in the State of Guanajuato, Mexico, and the expansion of provincial health care in the

Province of Kandahar, Afghanistan. The Government of the latter country also requested assistance from WHO in the preparation of a health Act which would provide for a complete systematic arrangement of decentralized health services. In addition WHO has been asked to help in framing a second five-year health plan in Sudan and to give assistance for surveys in Argentina and Colombia.

In certain other countries where integrated health services have already been developed on the rural level, further expansion has taken place. An example of this is the Rural Health Centre in Jitra, Kedah, Federation of Malaya, which is developing a curative and preventive service for the 60 000 people living in the local government area of Kubang Pasu. Another example might be taken from Central America where the health demonstration area in El Salvador, now in its sixth year of operation, has made good progress by establishing a permanent decentralized system of health services. Seven health centres and nine health sub-centres (or medical posts) have been set up, in some cases with assistance from the local inhabitants. For non-self-governing territories, WHO has suggested long-term planning of health programmes in order to ensure orderly development of health services with special emphasis on prevention. A review prepared by the Organization during 1956 summarizes the health conditions in each territory. WHO has also submitted observations to the United Nations Trusteeship Council on the development of the health services in the trust territories.

Nursing

As a result of the technical discussions which took place during the Ninth World Health Assembly on *Nurses: their education and their role in health progress*, a number of countries have taken action to improve nursing services and nursing education. An indication of the widespread interest aroused by these discussions is to be found in the fact that twenty-one countries included nursing representatives in their delegations to the Health Assembly. This was, indeed, the first occasion on which doctors, health administrators and nurses from all parts of the world were able to consider together the problems of nursing.

Training in basic nursing, midwifery and auxiliary nursing continued to receive WHO help. To meet the changing needs of expanding health services some current programmes were modified and fewer programmes of assistance were started, although those already in operation were strengthened, notably in Sudan and Malaya. WHO nurses in the field during the year numbered 191 in 43 countries. In order to prepare nurses for administrative and supervisory positions, basic programmes were extended to include post-basic training. More emphasis was given to the part played by the nurse in planning and developing health programmes, and in several countries WHO nurses assisted on the administrative level in creating or expanding nursing services. Refresher courses and in-service education continued to be an important part of the general programme. In some programmes—for instance, that for extending nursing training in a group of Bombay hospitals—the objective of preparing local nurses to carry the full responsibility for continuing the work has been achieved, and the international nurses have been withdrawn.

WHO made available a consultant in psychiatric nursing to five countries in the South-East Asia and Western Pacific Regions, in order to meet the urgent need for a psychiatric nursing service in those countries. Acting on a recommendation made by the Expert Committee on Nursing, WHO prepared a draft manual on nursing service administration, which was submitted to nursing administrators for comment.

Social and occupational health

In 1956 WHO began a study, with ILO assistance, on the cost and financing of medical care services. This was intended as a preliminary step in a long-term plan designed to assess what economic effort is required

from a community to provide comprehensive health care.

Where rapid industrialization and economic development are changing the life and working conditions of the people, occupational health is assuming ever-increasing importance. To avoid mistakes similar to those which were made in the mid-nineteenth century in countries then undergoing rapid economic expansion, WHO is promoting the establishment of institutes of occupational health, attached, if possible, to a school of public health or to a university which will provide the necessary scientific background to ensure confidence of the groups concerned in the action carried out by the institute. The first of these institutes will be established with WHO assistance in Egypt as part of the High Institute of Public Health at Alexandria. Plans are being made for similar work to be carried out in the South-East Asia Region.

A survey was made in Turkey during the course of the year by WHO and ILO preparatory to the drafting of plans for a project on occupational health services. Another survey was carried out by WHO, at the request of and in co-operation with the Universal Postal Union, on occupational diseases of postal workers.

Further help was given by WHO in planning and organizing rehabilitation services in Austria, Greece, Spain, Yugoslavia, and Lebanon. Pakistan was assisted in strengthening the training of physiotherapists by improving the existing rehabilitation service and establishing a school of physiotherapy.

Health education of the public

Health authorities in 18 countries and territories received assistance from WHO in reviewing needs and resources for educational work with the public and in strengthening their health education services. In Burma, Ceylon, Libya, and Paraguay WHO consultants on health education continued to serve with the national health ministries. Courses for medical officers and public health workers were organized with WHO help in Burma and Ceylon. A comprehensive study of educational aspects of the health services in several of the islands and territories of the Pacific was made, at the request of the South Pacific Commission, by the regional adviser in health education of the Western Pacific Region.

To help governments meet the growing demands for trained health educators, WHO has increased the number of fellowships granted for that purpose. In study courses for all types of public health workers particular emphasis was placed on the principles and practice of health education of the public. WHO also co-operated in the further development of post-basic training courses at institutes and schools of public health. As an example, WHO seconded a full-time lecturer to serve on the faculty of the School of Public Health at the American University at Beirut. In the Philippines, the Organization's regional adviser helped the Institute of Hygiene to plan and develop training in health education for medical officers, nurses, health educators and others. In addition, WHO gave assistance to national and provincial authorities in several countries in the planning and organization of in-service training in health education.

During the year work started on a study of training in health education, and a study on health education for teachers was begun in co-operation with UNESCO.

Maternal and child health

The anaemias of pregnancy, diarrhoea and enteritis in infants, training methods for health workers, and methods of obtaining morbidity data are some of the important questions connected with maternal and child health on which WHO has planned studies. The anaemias of pregnancy, for example, are an important cause of maternal mortality and morbidity in many areas. Not enough is known at present of their etiology, prevention and effective treatment to provide a basis for effective countermeasures, and a study is therefore being planned which will cover both maternal and child care and nutrition.

Another study, on diarrhoea and enteritis—the leading cause of death among infants and children in most countries of the world—will include the epidemiological, bacteriological and sanitation aspects, as well as those connected with feeding and child care methods.

The trend towards the integration of health programmes for mothers and children into the general framework of health services has become more pronounced during the year. Many maternal and child health programmes in Latin America, and in particular those in Colombia, Ecuador, and Peru, provide good examples of this tendency. In the Philippines and Taiwan, maternal and child health activities are now part of the more comprehensive work of rural health units. In the Eastern Mediterranean Region, the Calioub Health Demonstration Area includes a comprehensive maternal and child health programme. The number of State-wide public health programmes in India which include training in maternal and child health has now risen to 11. These, as well as much of the maternal and child health work in other countries, have been assisted jointly by WHO and UNICEF.

A WHO medical officer was assigned to Thailand as adviser to the Government on maternal and child health, and a request for similar assistance was received from Indonesia. It is noteworthy that these are the first requests received by WHO for advisers in maternal and child health at the national level.

Paediatric education has been the subject of several surveys undertaken by WHO since 1952. The Western European survey, made in co-operation with the International Paediatric Association, was completed in 1956. A similar survey was carried out in the Americas, also in 1956, and another was planned for South-East Asia.

Mental health

Increasing attention has been paid during 1956 to the development of community mental health services along the lines recommended in the third report of the Expert Committee on Mental Health.[4] One method of development is the improvement of facilities and extension of the scope of psychiatric hospitals to provide extramural treatment and other services for the community. An example of this type of development in its early stages is shown in Jordan where, through WHO assistance, facilities at the psychiatric hospital were modernized, mental health workers were trained, and short courses on the principles of mental health work were arranged for general nurses.

As the shortage of trained mental health workers of all kinds remains acute WHO has provided a number of fellowships for study abroad and has helped in the improvement of national training facilities. This was done in Thailand, for instance, where training programmes in child psychology were started with the help of a WHO consultant. Another example of WHO participation in the extension of training programmes is to be found at the All-India Institute of Mental Health, where the Organization has helped in the establishment of a post-graduate training programme in psychiatry and psychiatric nursing, and of a research programme in psychiatry, neurology and neurosurgery. A WHO consultant in psychiatry and electrophysiology directed the setting up of electroencephalographic apparatus at the Institute and trained others in its use. Two psychiatric nurse consultants organized training courses at the Institute, where they collaborated closely with the WHO psychiatrist. Other consultant advice has also been provided by the Organization, for instance, advice to the Government of Chile on developing a programme for treating alcoholics.

Nutrition

"One of the most important causes of morbidity and mortality in large areas of the world is the absence of food suitable for the infant at the time of weaning and sufficiently

[4] *Wld Hlth Org. techn. Rep. Ser.* 1953, 73

rich in protein. Protein-rich foods are available in adequate amounts almost everywhere, but the means by which they can be processed or used in combination with other foods to serve as an adequate diet for the young child require further investigation." This problem has been of considerable concern to WHO and, as a result of a meeting of leading authorities on child nutrition which was held in 1955, a small group drawn from the members of the Expert Advisory Panel on Nutrition was formed to advise the Organization in this specialized field. This group held two meetings during 1956, and representatives of UNICEF, FAO and WHO attended. Satisfactory agreement was reached on future work, and the Rockefeller Foundation set aside a sum of $250 000 for further research. These activities led to programmes for the investigation and use of sesame-seed presscake and peanut presscake, and work on a number of other foods is now being planned. This work is being carried out in co-operation with public health research laboratories in various countries.

WHO has made grants to nutrition research centres in India, Uganda and Guatemala and considerable advances have resulted from the work undertaken. " In India extensive investigations have been carried out with various mixtures of readily available local foodstuffs and this research programme has now become part of a large well-planned scheme for the prevention of malnutrition. In Uganda and Guatemala mixtures of inexpensive local foodstuffs have been developed which can apparently maintain satisfactory growth and therefore offer hope for the development of preventive programmes. In the course of the work in Uganda it was found that vegetable oils, unlike animal fats, are well tolerated by protein-deficient children. This is an important finding, because it allows a calorie-rich diet to be used for the treatment of young children, in place of the diet with low calorie content which has had to be used hitherto."

The nutritional anaemias, which, as the Annual Report points out " are a serious public health problem in many parts of the world ", were the subject of WHO surveys in India and Mauritius in 1955. Morbidity and mortality due to nutritional anaemias are high in Mauritius, and at the Government's request, a haematologist was sent by WHO in 1956 to help in clarifying their etiology; he will shortly be joined by a nutritionist.

Advice and assistance from WHO were requested from many countries which are rapidly expanding their health services and wish to integrate nutrition programmes into their public health work. The Report points out that, in order to achieve this, much fuller use could be made than has hitherto been the case of the facilities for preventing malnutrition that are available through maternal and child health and other services.

Dental health

A dental health officer was appointed to the staff of WHO in 1956 and the general lines of the Organization's dental programme were laid down. Consultants in dental health were also provided for Hong Kong, India and the Philippines.

Health work among Palestine refugees

WHO has continued to assist in the health care of some 900 000 Palestine refugees residing in Lebanon, Syria, Jordan and in the Gaza area. About 44% of these refugees live in 58 camps, and the remainder reside in towns and villages. A variety of health services are provided by the United Nations Relief and Works Agency (UNRWA), including sanitation, dental health, housing, and supplementary feeding services. WHO, in addition to providing a public health administrator, a malariologist, a public health engineer, a health educator and part-time consultants, as in 1955, also recruited a public health nurse in 1956 to supervise the nursing work. The total number of health workers employed in the service on 30 June 1956 was 3368, of which 19 were internationally recruited, the rest locally recruited from among the Palestine refugees.

The general health of the refugees remained good throughout the year. There were no cases of any of the quarantinable diseases. All the 43 cases of relapsing fever reported were tick-borne. Prophylactic inoculations and the provision of safe water supplies contributed to a further decrease in morbidity resulting from enteric diseases. As in previous years dysentery and eye diseases continued to be the most common infections, particularly during the summer months.

The attendance for the year at the maternal and child health centres amounted to 120 000, and at the infant health centres to almost half a million. Both these figures are considerably above those for previous years. The number of clinical malaria cases dropped by nearly 50% as a result of malaria control measures.

Assistance in tuberculosis control was given by a WHO consultant from the Eastern Mediterranean Regional Office. A registration system was introduced which ensured the regular surveillance and continued treatment of patients and the tracing of contacts.

Further improvements were made in environmental sanitation, and new camps with good shelter standards were opened. Successful health and education work has meant that those refugees living in camps now have cleaner surroundings and they have co-operated much better in the health services made available.

ENVIRONMENTAL SANITATION

One important aspect of the work carried out in this field during 1956 was that concerned with the development of insect resistance to insecticides. The development of resistance is a fact which is now generally recognized to be of vital public health importance. A determined effort has therefore been made by the Organization to co-ordinate research on the subject, including research on the biochemical and physiological bases of resistance, about which information is still incomplete. WHO completed a world-wide survey which covered some 100 laboratories working on insect resistance and the results of this survey were sent to the Expert Advisory Panel on Insecticides for comment.

WHO established contact with all laboratories working on resistance to insecticides, and on the basis of information supplied by them and other sources produced a circular which is despatched every other month to some 200 research workers. Other activities carried out by the Organization included: the development of standard methods for testing resistance in adult mosquitos and mosquito larvae and encouragement of their routine use; analysis and publication of the results of a world-wide test on the resistance of body lice to insecticides; and the despatch of a WHO consultant to Africa in order to make a first-hand examination of resistance of body lice to DDT and BHC in certain areas.

The toxic hazards of the new pesticides were considered by a WHO study group, in which FAO and ILO collaborated. As well as outlining protective measures for operators handling these pesticides, the group gave attention to the type of information required for a full understanding of toxic hazards. Conjointly with the stimulation of tests with new insecticides WHO is gathering information on their possible toxic effects.

In collaboration with the Tropical Testing Establishment of the Nigerian Government at Port Harcourt, WHO resumed experiments on the effects of tropical storage on the physical characteristics of insecticide formulations. This work will continue in 1957.

During 1956 WHO devoted special attention to the following particular aspects of environmental sanitation: the development of administrative organizations, improvement of rural sanitation, training of sanitation personnel, and dissemination of information.

Demonstration and training programmes in environmental sanitation arranged with WHO assistance were enlarged. The training

side of rural sanitation projects, such as those undertaken during the year in Burma and Indonesia, was given particular attention. Because many local health departments lack qualified sanitary engineers WHO has either given assistance in the organization of special short training courses, or else has helped in developing regular courses in existing institutions. Short courses were organized in collaboration with the Danish and Swedish Governments, and sanitary engineering courses were initiated at the Engineering School in Iraq.

WHO gave advice on public health engineering to a number of provincial and central health administrations interested in developing or reorganizing their sanitation services. Stress was laid on the integration of sanitation into national plans for the general improvement of public health services.

Other studies which were actively pursued during the year were those on the establishment of international standards of drinking water quality and standard methods of water examination, milk hygiene (in collaboration with FAO and UNICEF), the relationship between irrigation engineering and the spread of bilharziasis, and, in collaboration with the United Nations, community development and the utilization of water resources.

EDUCATION AND TRAINING

The Annual Report summarizes the basic objectives of the Organization in this sphere in the following terms: " to enlarge and strengthen local educational facilities; to provide opportunity for further training abroad; to encourage the continuation of study beyond the usual professional courses; to promote better standards in professional education and training; and to study events in the world-wide field of education and training ".

In addition to these objectives WHO continued to emphasize the importance of the preventive aspects of medicine and public health in all teaching programmes. For this reason assistance was given to medical schools to enable them to establish chairs of preventive medicine so that the subject could be better integrated into the undergraduate curriculum. However, not all medical schools accept equal status for a chair of preventive medicine, and in some countries although the principle may be accepted, qualified teachers are not available. To meet this lack WHO has promoted a teacher-training programme in preventive and social medicine.

To help medical schools adapt their curricula to meet the needs of foreign students WHO continued to grant fellowships to professors of schools of public health to enable them to visit those countries whence substantial numbers of their students come and thus to acquire a better understanding of the conditions and problems in those countries.

It has been found that there is often a lack of clear ideas as to how the medical student can most effectively be made aware of the importance of the preventive aspects of the subjects he is required to study. Moreover, the necessary emphasis on prevention can be given only if the teachers themselves are fully persuaded of its value. With this in mind, WHO arranged consultations with physiologists from different parts of the world to prepare for a meeting of a study group on the concept of prevention in the teaching of physiology—one of the subjects in the preclinical curriculum which seems to lend itself best to the preventive approach. Conferences for professors of preventive medicine were also sponsored in Europe and in Central and South America.

The case of practising physicians who have part-time public health duties, but who lack training in preventive medicine is being actively studied by WHO. Their problem is one of some intricacy as " many of them cannot afford to leave their practices for the time needed for full training, but in many parts of the world the practice of preventive medicine

is largely in their hands ". The WHO Conference on the Public Health Training of General Practitioners which was held in October suggested certain educational and training methods which might prove suitable for such physicians.

Assistance to national teaching institutions has taken the form of assigning a teacher to initiate work, organize the teaching department, and train others to carry on. This method has already proved effective and under the 1956 programme WHO visiting professors served a total of 335 months in 17 countries. Assistance was also given to Ethiopia, Libya, Nepal, and Nigeria in the establishment and operation of schools for training auxiliary personnel in order to provide new health services.

As a further development of the evaluation made in 1955, a review was undertaken of the results of the fellowships programme in the years 1947-52. Altogether 576 of the fellowships granted during that period were examined, and the review showed that, although the degree of success has differed in different countries, the results have in the main been satisfactory. Through such evaluations, governments and WHO can obtain guidance on such factors as the selection of candidates, the training of fellows and the use made of them on their return to their own countries. In addition, 883 fellowships were awarded between 1 December 1955 and 30 November 1956.

Other work carried out under the education and training programme during the past year included the compilation of an annotated bibliography on medical education for the years 1946 to 1955 inclusive and commencement of work on a review of legislation governing medical education in different countries.

ATOMIC ENERGY IN RELATION TO HEALTH

WHO's work in regard to the peaceful uses of atomic energy was placed on a sound basis in 1956. The Annual Report summarizes the aims of the WHO programme as follows: " First, and perhaps the most important, to provide training; secondly, to collect and distribute information on the medical problems of atomic energy and the medical uses of radioisotopes; thirdly, to study the health problems involved in disposal of radioactive waste; fourthly, to work with other international agencies for the distribution of radiation standards, to recommend codes of practice, and to recommend pharmaceutical specifications for the preparation of radioisotopes for medical use; and fifthly, to stimulate and co-ordinate research on the health aspects of radiation." The training programme will cater for the following three categories of workers: specialists (normally either physicians or " health physicists ") for protection work in atomic energy laboratories; public health administrators and sanitary engineers who are particularly interested in such questions as the disposal of radioactive waste and the sitting of reactors; and medical users of radioisotopes.

Recommendations on the general work of the Organization on the basis of the programme outlined above were made by the Study Group on Radiological Units and Radiological Protection, convened by WHO, at its meeting in April. In addition to recommending that WHO should continue and expand its consultative services to governments on radiological protection and the disposal of radioactive waste, the Group also proposed methods by which WHO " could help in the problem of establishing adequate international facilities for standardization of X-rays and radioisotopes in collaboration with the International Commission on Radiological Units and Measurements."

The study group also made certain recommendations on training, and on undergraduate and post-graduate education. In particular, it felt that an attempt should be made to give medical students an idea of the

effect that the development of atomic energy has had on the medical sciences.

Another study group met to examine the effect of radiation on human heredity. This question is of immediate concern to WHO as " the genetic as well as the possible somatic effects of low doses of radiation on large populations appear to be of considerable public health interest, especially in connexion with the evaluation of the effects on health of radioactive waste disposal and of the large-scale use of X-rays in medicine ". The group made detailed suggestions for further research on radiation effects.[5]

During the year WHO awarded a number of fellowships, some for attendance at an advanced course organized by the French Government on radiation protection, others for the study of the problem of radioactive waste disposal, and one for a study on the safe handling of radioisotopes.

[5] The report of the Study Group on the Effect of Radiation on Human Heredity, together with the papers presented by various members of the Group, will shortly be published by WHO

EPIDEMIOLOGY AND HEALTH STATISTICS

Health statistics

The importance of improving health statistics has been mentioned in previous Annual Reports and it is once again stressed in the Director-General's Report to the Tenth World Health Assembly. The Report reveals that " reliable health statistics are available for the whole of only some 30 countries, and for selected towns in a few others. Adequate statistics do not exist for most of the population of the world, because of lack of physicians for diagnosis and of administrative machinery for recording. For the same reasons the statistics for the areas with the greatest health needs are insufficient to call attention to these needs. WHO must therefore help countries to set up or improve their health statistical machinery, before it can use statistics in determining where its help can most effectively be used."

One of the more important tasks with which the Organization is concerned is the promotion and stimulation in economically under-developed areas of methods designed to yield health information of sufficient accuracy to serve as a guide for health administrations. The National Committees on Vital and Health Statistics, of which there are now 33 in various parts of the world, could obviously play an important role in this work. WHO has also made contributions towards progress in this field with advice on the grant of fellowships for health statistical training and by the dispatch of consultants to give assistance in the organization of statistical services. Seminars on vital and health statistics were also organized—one, for instance, in collaboration with the Government of Viet Nam, and another jointly with the Commission for Technical Co-operation in Africa South of the Sahara. A number of the conclusions reached at the second of these, and based on experience in various parts of Africa, were seen to be applicable to under-developed areas in other continents as well.

Apart from the normal continuation of work involved in the collection and publication of routine epidemiological data and vital statistics, data on special subjects have been assembled and published in the *Epidemiological and Vital Statistics Report* to meet the particular needs of expert groups and committees, or at the request of health administrations and research institutes. Certain special studies were also published in the *Bulletin.*

The application of statistical methods to WHO field projects and to the work of technical units has been carried on and the Annual Report makes mention o an outstanding example in Morocco. Here, in the first field study of this kind on human beings, statistical methods were used to ascertain the

relative efficacy of three different forms of treatment for trachoma.

Among the other activities in 1956 were: examination of statistical procedures for assessing the quality of drinking water; help in preparing suitable schedules and recording procedures for family health surveys in India and Sweden; and assistance in the statistical planning of tuberculosis surveys in Africa.

International quarantine

The year 1956 marked the entry into force of two sets of Additional Regulations to the International Sanitary Regulations. These dealt with the amendment of provisions relating to yellow fever, and the modification of the form of the international certificate of vaccination against smallpox. Adoption by the Ninth World Health Assembly of further Additional Regulations had the effect of withdrawing, as from 1 January 1957, the special measures applying to the Mecca pilgrimage. In connexion with this change the Annual Report notes that Saudi Arabia has, with the help of technical advice from WHO, established a large modern quarantine station at Jeddah. In 1956, WHO, at the request of the Saudi Arabian Government, arranged for a group of quarantine experts to visit Saudia Arabia and report on health installations catering for pilgrims. The group reported favourably to the Committee on International Quarantine with the result that the abrogation of the special provisions relating to the Mecca pilgrimage in the International Sanitary Regulations was recommended.

A survey of sanitary charges levied in ports was continued in 1956. "It showed that in fact few countries continued to levy charges which are not authorized by the Regulations, and that the health authorities concerned, when their attention was drawn to the matter, readily consented to bring their practices into line with the Regulations. All the countries which still required bills of health have now agreed to cease the practice in order to conform with the International Sanitary Regulations."

At the request of the Committee on International Quarantine the Organization carried out an enquiry to determine whether the direct transit areas at 37 airports located in 24 countries conformed to the requirements demanded by the International Sanitary Regulations, in particular as regards the segregation and medical supervision of passengers and air-crews.

DRUGS AND OTHER THERAPEUTIC SUBSTANCES

In 1956 the standardization of pertussis vaccine was successfully completed. This ranked as a considerable achievement, for the laboratory studies which had been carried out in parallel with field trials had shown that the protective value of a pertussis vaccine in children was indicated by the laboratory assay in mice. This was unique in the history of vaccine control and pertussis vaccine is the first bacterial vaccine to be internationally standardized.

The availability of the new stable freeze-dried smallpox vaccine has been mentioned elsewhere in this review. No international standard has yet been proposed for a poliomyelitis vaccine, although several laboratories are now trying to develop stable freeze-dried products.

The Expert Committee on Biological Standardization approved the establishment of international standards for various antibiotics and gave further consideration to a programme for the standardization of antivenins.

During the course of the year the Expert Committee on Addiction-Producing Drugs made recommendations for bringing under international control two analgesic drugs of

morphine-like character. The Committee also gave more precise definitions of habit-forming drugs. It felt that the barbiturates, as habit-forming and in some circumstances addiction-producing drugs, and the tranquilizing or ataraxic agents, as potentially habit-forming drugs, should be subjected to national control measures. The medical principles and methods for the treatment and rehabilitation of drug addicts were also outlined by a study group.

Apart from work directly concerned with drugs and pharmaceutical preparations, the Organization also undertook certain other related activities. In some countries, for instance, a need has been felt for recommendations on simple but reliable laboratory methods for the diagnosis of various diseases, and work has therefore been started on a manual incorporating such recommendations. A paper was published on the first of the diseases to be considered—plague—and others are to follow.

Another new WHO activity concerns the public health aspects of food additives. In December, the Joint FAO/WHO Expert Committee on Food Additives met and formulated general principles governing the use of non-nutritive substances added to food to improve its flavour, appearance, texture, or storage properties. The Committee concluded that, while the use of such additives was justified for certain purposes, it should not be permitted if, for instance, the additives disguised faulty processing or handling techniques, deceived the consumer, or substantially reduced the food's nutritive value. The Committee also agreed that each additive should be most carefully tested and that the decision to use it should be based on the judgement of properly qualified scientists.

REGIONAL ACTIVITIES

Much of WHO's work in the field, to which allusion has already been made, is conducted by the six Regional Offices of the Organization. Although it is beyond the scope of this review to give a complete picture of all activities under way in each Region, nevertheless some of the typical projects in operation during the year are mentioned in the following pages.

AFRICAN REGION

Work in the Region during 1956 was concentrated primarily on problems of malaria, treponematoses, leprosy, tuberculosis, and malnutrition. Efforts were again made to improve standards of nursing and health personnel.

Many leprosy control projects, based on mass treatment with sulfones, were in operation in the Region. Nigeria, for example, had an extensive treatment scheme, and in French Equatorial Africa the Government, aided by WHO and UNICEF, embarked on a campaign which is now being intensified. Of the 150 000 leprosy patients in the territory, more than 100 000 are now receiving regular treatment. Leprosy control activities of various types were also under way in French West Africa, Uganda, and Gambia.

Campaigns against yaws, jointly assisted by UNICEF and WHO, are in operation or being planned in many parts of Africa, including Liberia, Sierra Leone, Gold Coast, Togo (French Trusteeship), Togoland (British Trusteeship) and the Federation of Nigeria. Stimulated by these campaigns, certain communities in Nigeria have themselves provided funds for further medical help and for setting up rural health centres. Campaigns are under consideration for French West Africa, French Equatorial Africa, Mozambique, Tanganyika, and Uganda. The health administrations of the Belgian Congo, the French Cameroons and other countries are continuing the anti-yaws activities already undertaken.

Investigations continued in 1956 into some of the severe nutritional problems which afflict the Region—for instance, kwashiorkor,

anaemias, pellagra and endemic goitre. Results obtained by a WHO nutrition team which had been working on the kwashiorkor problem in Uganda revealed that 10%-25% of the children between the ages of 1 and 3 years pass through a phase in which clear signs of malnutrition can be found.

In Basutoland the Government has recently started a pilot project against pellagra, the most important nutritional problem there. A WHO team is making a detailed survey of deficiency diseases in the territory and has made several clinical nutrition surveys and spent one year on a family dietary survey.

The most common cause of morbidity and mortality in some parts of Africa is the anaemias. The island of Mauritius is a typical example and WHO has assisted there in research into the question. Malaria, which was formerly endemic in the island, was thought to be the cause of many of the anaemias, but although malaria has now been eliminated the problem of anaemias has shown no improvement. At the Government's request, therefore, WHO has sent a haematologist to assist in clarifying the etiology of these conditions.

One of the more important activities of the Regional Office during the year was the organization of a Seminar on Vital and Health Statistics, which was jointly planned and convened by the WHO Regional Office and the Commission for Technical Co-operation in Africa South of the Sahara. This stemmed from recommendations by both the Expert Committee on Health Statistics in 1954 and the Conference for the Seventh Decennial Revision of the International Lists of Diseases and Causes of Death in 1955 that WHO should devote a substantial part of its statistical activities to a search for methods suitable for under-developed countries. The seminar was therefore planned to give representatives of statistical and health administrations in the Region an opportunity to discuss their common needs, and such experience as they had of ways to meet those needs, in vital registration, population recording and medical reporting.

REGION OF THE AMERICAS

Three principal long-range objectives governed the work in this Region during 1956—the strengthening of health services, the promotion of education and training, and communicable disease eradication.

Considerable progress was made during the year towards malaria eradication. The Annual Report gives prominence to a description of the organization and administration of Mexico's programme of malaria eradication, which is being carried through in close collaboration with WHO and UNICEF. The Organization has assigned a malariologist, an insect-control adviser, and two sanitarians to the project. It has also awarded a number of fellowships to Mexicans for malaria study and training in Venezuela, Brazil and the USA. Other WHO assistance included training for antimalaria workers and continuing close collaboration with the Mexican national malaria service in plotting every step of the campaign.

Guatemala received help from the Organization in the establishment of a training programme for nursing auxiliaries. Initially the work consisted of a training course for instructors, and this was followed in May 1956 by a course for auxiliary nursing personnel, which was attended by 106 students and given by ten instructors trained in the earlier course. Later the trainees began their clinical practice in the Guatemala City General Hospital. It is hoped that training will be continued until there are instructors in at least one centre in every province and in the principal hospitals of Guatemala City.

The supply of adequate numbers of reliable and disease-free animals to laboratories is essential if research is not to be hindered, and this question has been of direct concern to the Organization during 1956. A project was designed specifically to assist national public health laboratories in the establishment of disease-free animal colonies. Requests for assistance were received from eighteen countries for more than twenty laboratories. WHO provided consultants to

give expert advice on the best methods of keeping and using laboratory animals and to undertake surveys of the present situation and future needs. Demonstrations, seminars and fellowships were also arranged to aid in the training of national personnel.

Among other work carried out in the Region during 1956, mention may be made of the continued assistance in the rural public health services project in Ecuador, which included the training of 92 public health workers in five courses and the beginning of a programme of supervision of auxiliary personnel. The Organization also gave advice on a variety of statistical questions to many countries.

SOUTH-EAST ASIA REGION

The main emphasis in 1956 was placed on basic needs such as sanitation, health education, and training—particularly for auxiliary health workers. Activities continued to expand and 116 WHO-assisted projects were in operation in the Region as compared with 99 in 1955. Sixty-two fellowships were awarded between 1 January and 30 November 1956.

The training of all categories of health and medical personnel played a significant part in the year's work. Many refresher and post-graduate courses were organized; WHO field staff assisted in 30 refresher courses which provided advanced training for approximately 400 participants.

WHO increased its assistance to statistical services in countries of the region and, in some instances, aided in the organization of statistical systems. This work is considered to be of particular urgency as the Report reveals that for three out of the seven countries in the South-East Asia Region no reliable birth and death-rates are available.

The Regional Office devoted considerable attention in 1956 to the promotion of rural health centres on which it is foreseen all medical services will be based. As the Report points out, the rapid development of rural health services is the first step in the integration of disease control programmes into the general public health services.

Referring to some of the other major activities, the Report states: "Malaria-control programmes in the seven countries of the Region are gradually being directed towards eradication, which, in four of these countries, there is a prospect of achieving within a reasonable time. Campaigns against leprosy continue to make slow progress; in four countries action against it is now being undertaken on a national scale. Plague seems to have become less acute in the last few years, which is possibly due in part to the effective insecticides used in malaria campaigns. Research on plague is being carried out in two of the countries of the Region, with the assistance of WHO, and may lead to new methods of control. According to present plans, spraying in connexion with the malaria-control campaigns will in time cease and therefore research on plague becomes doubly important."

The Indian Plague Research Project, which is assisted by WHO, has been in operation since 1952. The year 1956 saw intensive field research continued and the establishment of a field laboratory in the project area. " Thirty-two strains of *Pasteurella pestis* were isolated from different species of domestic and wild rodents in the course of more than 13 000 autopsies of rodents. Laboratory studies have been carried out to identify the different strains and to compare them with already known types; this research is still in progress. The susceptibility to the infections of strains of *P. pestis* of each of the species of wild rodents present in the project area was investigated in the laboratory of the Institut Pasteur in Teheran [which has been actively associated with this project since 1954] and it was established that rodents of the species *Tatera indica* showed the greatest resistance to plague infection."

Work is still continuing and no final conclusions have yet been drawn from the epidemiological research so far undertaken. However, the experience which has already been gained in this project will be put to good use in Indonesia, as the Government there has requested help from WHO in examining the plague situation in the country

and modifying the control methods now in use.

In Ceylon a programme to improve rural sanitation was initiated in 1955 with assistance from WHO and UNICEF and financed by the United Nations Expanded Programme of Technical Assistance. A pilot project at Kurunegala was in operation during 1956 and when sufficient experience has been gained it is proposed to extend similar sanitation measures to all parts of Ceylon. Work has been concentrated on improving local water supplies and bettering methods for the disposal of organic wastes. A number of protected wells with hand pump equipment were constructed and about a thousand latrines were made.

Among other noteworthy projects in operation in the Region were the following:

1. A three-week regional seminar for nursing leaders which was held in Delhi in August; thirty-one nursing leaders from Burma, Ceylon, India, Indonesia and Thailand participated.

2. The work in Bombay State designed to improve and expand the existing maternal and child health services was continued. Emphasis was placed on the needs of rural areas. The project is assisted jointly by WHO and UNICEF and was started in August 1955. Under the Technical Assistance Programme WHO has provided a maternal and child health officer and two public health nurses. A training centre was established at Sirur, near Poona, where medical officers in charge of village dispensaries received courses in public health with special reference to rural services. In 1956 a total of 485 medical officers, nurse-midwives, midwives, and sanitary inspectors completed courses at the training centre.

EUROPEAN REGION

The untimely death of the Regional Director, Dr Norman Begg, in 1956 was a serious loss not only to the Regional Office but also to many friends of WHO throughout the Region. Dr P. J. J. van de Calseyde was nominated as his successor.

The principal features of WHO's work in the European Region during 1956 continued to be the study of health problems common to countries of the Region, the spread of information, the exchange of ideas, and the training of health personnel. Much of the work took the form of inter-country programmes. Technical meetings organized by the Regional Office covered such subjects as professional education and the organization of public health services. The series of European seminars for sanitary engineers afford an example of co-operation between governments of the Region and WHO. In 1956 the Fifth European Seminar for Sanitary Engineers was held in Helsinki, in co-operation with the Government of Finland. Principal topics of discussion were: ground water pollution (especially of chemical and organic origin) in Europe and measures for its prevention; the pollution problem in relation to water economy as a whole; the dangers associated with the disposal of certain toxic industrial wastes; special problems in northern Europe in disposing of pulp-mill wastes; and the increasingly important problem of the safe disposal of radioactive wastes.

As part of the Regional Office's long-term plan for the furthering of nursing education, a conference on post-basic nursing education was convened in 1956 as a sequel to the study group on basic nursing curriculum held in 1955. WHO organized the conference in co-operation with the United Kingdom Government and with the assistance of the Department of Health for Scotland. Special consultants in nursing education, general education, psychology, sociology, and public health administration assisted in the work of the conference.

In the course of the year the Regional Office devoted considerable attention to the question of accident prevention both inside and outside the home. With more effective control of the infectious diseases accidents have assumed greater prominence as the cause of sickness and death, and, as the Report says: "... accidents have also increased absolutely; for technical advances,

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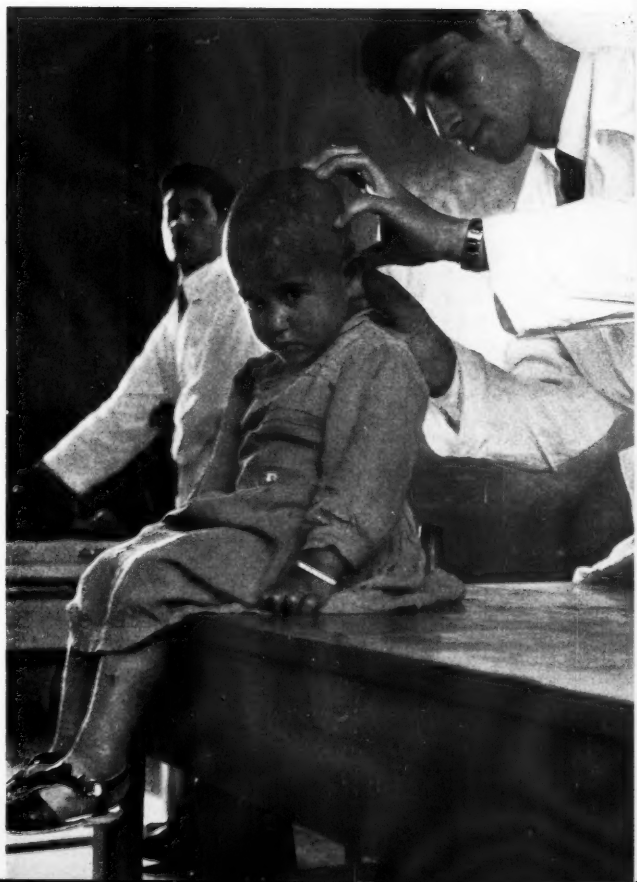
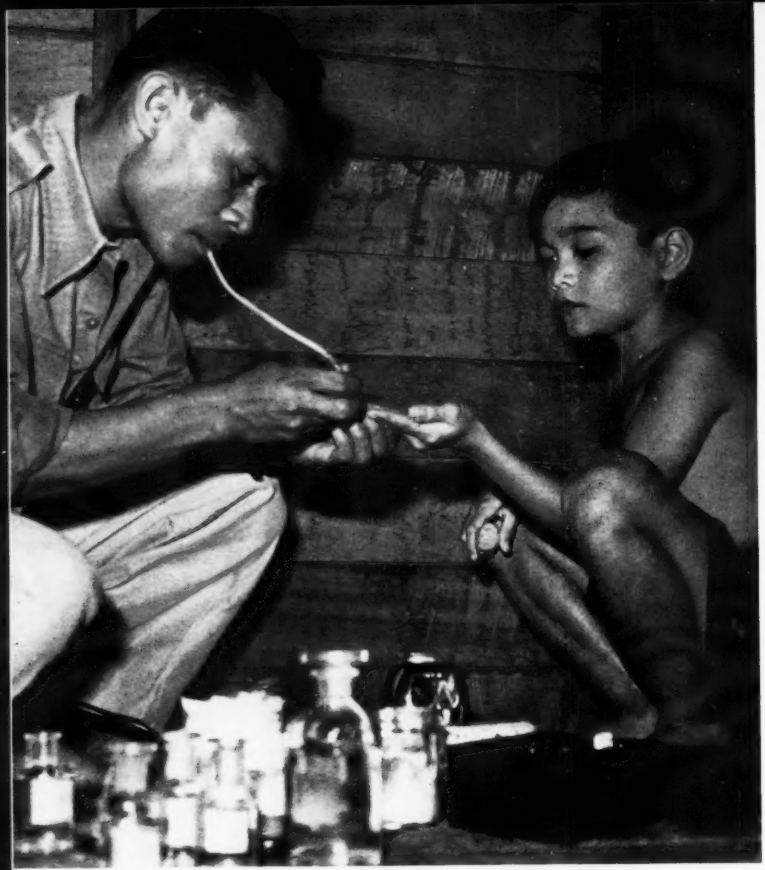
FAVUS IN SYRIA

Children infected with favus number about 40 000. Of this total 30 000 have been examined and 7 000 treated in the campaign against this disease. In the picture above a Syrian doctor attached to the favus control team examines a child's hair for signs of fungus. At right an X-ray technician prepares a child for treatment





Bilharziasis control on the island of Leyte in the Philippines. A member of the team taking a blood sample for a haemoglobin test

School health programme in Thailand. Trainee teachers receive practical instruction in examining children

industrialization, and increasing mechanization in Europe create new hazards. At the same time, knowledge about accidents is accumulating; organized attempts to reduce accidents are gaining momentum; and the conception that accidents are the result of fate, bad luck, or chance is gradually losing currency." The meeting of the Advisory Group on the Prevention of Accidents in Childhood, which was convened by WHO, considered, in particular, methods for collecting and analysing data concerning accidents. It concentrated its discussion on the basis of preventive measures and made a number of detailed recommendations. These included the need for public health authorities to give accident prevention work a high priority in their programmes and the necessity of obtaining more particularized information concerning accidents themselves and morbidity which may lead to them.

Another aspect of WHO's work in Europe during the past year was the continuation of assistance to various European countries in the rehabilitation of handicapped children. In Yugoslavia, where there are estimated to be some 12 000, a WHO consultant has made a detailed survey of the facilities and needs in the six Yugoslav Republics. In Greece a WHO consultant and a UNICEF representative discussed a national rehabilitation plan with the Greek Government. As a result a national council for rehabilitation was set up by the Government. Discussions of a somewhat similar nature, in which WHO participated, took place in Spain where a national rehabilitation plan it at present being considered. WHO and UNICEF have also continued to assist rehabilitation work in Austria and Italy.

EASTERN MEDITERRANEAN REGION

Although WHO's work in this Region during the year was concentrated primarily on strengthening national health services, expanding and improving educational opportunities for their staffs, and developing control methods for the major communicable diseases, the Report underlines the fact that many different types of programme are necessary in the Region in order to meet the individual requirements of countries which are in very different stages of development.

The Report provides examples of the differing types of programme necessary for work in the field on malaria eradication and against tuberculosis. In those countries where malaria eradication programmes are impracticable, WHO has restricted its work to surveys, research and small pilot projects. In the case of tuberculosis it has been found that with certain countries it is not economically justifiable to embark on mass BCG operations. WHO's survey teams have found that although tuberculosis is present in all countries in the Region its incidence is uneven.

One development in the Regional Office during the year was the appointment of four public health advisers to co-ordinate WHO programmes in small groups of countries in the Region. Preliminary results of this trial system showed it to have strengthened the link between the Regional Office and the national health administrations.

An important Regional project which made considerable progress in 1956 was the training centre for auxiliary health workers which is located at Gondar, the capital of Begemedir Province in eastern Ethiopia. This centre, which is a joint project of UNICEF, the United States International Co-operation Administration and WHO, was established as a sequel to a formal request made by the Ethiopian Government. The school opened in 1954 with some 30 student health officers on a three-year course. In 1955 a second course was started for health officers and a first two-year course for community nurses, and in 1956 there was a one-year course for sanitarians. In conjunction with the training centre, which is attached to the existing hospital at Gondar, the nucleus of a provincial health service has also been started. One health centre has already been established and others are planned.

Antimalaria work in Iraq in 1956 was organized on a malaria eradication basis. The WHO demonstration team, with full governmental co-operation, carried out residual

spraying in the four northern districts of Iraq and gave protection to approximately 1¼ million inhabitants. A further 150 000 people living in urban areas were also indirectly protected by spraying a belt around the cities as well as by larviciding. Since the inception of WHO/UNICEF-assisted malaria control in 1952, WHO staff members have taken full charge of the expanding antimalaria activities in the northern districts and demonstrated means whereby the control programme could be transformed into an eradication programme. A five-year malaria eradication programme has now been sanctioned by the Iraq Government, whose total expenditure over this period will amount to more than $8 000 000.

In view of the rapid evolution of health services in various countries of the Region, WHO organized a travelling seminar on public health administration. This gave health officers an opportunity of discussing their own problems and of seeing what was being done elsewhere. The group, which was led by two experienced consultants who acted as seminar leaders, comprised 15 participants from 14 countries and territories of the Region. They visited various types of health service projects in Egypt and Sudan. Particular attention was paid, in Egypt, to the WHO assisted Calioub Demonstration Area, the objects of which are to find out the best way of providing rural health services within the financial means and in harmony with the social structure of the country, and in Sudan to the ten-year health development plan and the system of training and utilization of auxiliary personnel.

WESTERN PACIFIC REGION

In general terms the Western Pacific Regional programme in 1956 was directed towards strengthening national health services, integrating field projects in a planned public health service, and methods of alleviating the shortage of trained personnel, both professional and auxiliary.

One of the major problems in the Region is that of environmental sanitation. An aspect of this question to which the Regional Office has devoted considerable attention is the collection and disposal of organic wastes. WHO collaborated closely with the governments of the Region, and in particular the Government of Japan, to develop a practical solution to this problem. Following advice from WHO, a pilot plant was constructed in Kobe, Japan for aerobic composting of urban refuse and night-soil. After a year's successful operation, the Japanese Government decided to proceed with the construction of a full scale prototype composting plant. This, which was operating in 1956, showed that the aerobic method was practical and economical. The Japanese Ministry of Health and Welfare is now proposing to subsidize the erection of similar composting plants in ten other Japanese cities.

The techniques developed during the work in Kobe were presented at a seminar organized by WHO in Taiwan on the collection, disposal and utilization of organic wastes. The seminar was attended by about 40 public health technicians from seven countries of the Region.

The Central Medical School in Fiji, which has a history dating back to 1878, has received assistance and advice from WHO in the course of the past few years. Advice was requested by the Fiji Government and as a result of recommendations made, WHO provided two lecturers for four years and two fellowships. The Government has cooperated closely and the standard of teaching in the school has been improved and it is becoming of increasing importance in supplying trained health personnel for the smaller Pacific territories.

Other work in the Region during the past year included a nursing education project in Japan; the continuation of yaws control measures in the Pacific islands; the consolidation of BCG programmes as a preliminary to their incorporation in national public health services; and the establishment of two Regional poliomyelitis centres—one in Singapore and the other in Tokyo. Several countries have already made use of these centres and work is expected to increase.

Promotion of Research by WHO

Extracts from the introduction to the Annual Report of the Director-General for 1956

"[Research] . . . constitutes the real backbone of the various activities through which the Organization is striving to promote world health . . . the experience gained through the field projects initiated by WHO has demonstrated the need for the Organization to stimulate and co-ordinate research work. Indeed, when public-health measures are applied under unusual circumstances, it is often found that not enough is known about the problem and its environmental aspects to ensure success. In fact, many of the preliminary pilot studies, which are conducted by the Organization before deciding on a plan of action, can be considered as carefully designed research projects, the results of which are of value not only to the country immediately concerned but also to other countries where similar conditions exist.

The task of defining a given public-health problem in its simplest terms and the setting-up of a research programme which might be needed for its solution is sometimes carried out by the Organization's technical staff in consultation with members of the various expert advisory panels. Often, however, the initiative in this field begins in an expert committee and subsequently the co-operation is also secured of the leading authorities on the particular subject of research. In other cases both devices are used at various stages of the preparation of the programme.

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The latter method was employed in connexion with the problem of development by disease vectors of resistance to insecticides. I have already mentioned the importance of this problem for the future of antimalaria work, but it is obvious that this issue has a general bearing on the future of a number of activities undertaken against various other communicable diseases. It is imperative that we learn more about the fundamental facts concerning resistance and about the ways in which it can be avoided or prevented. The first logical step taken by the Organization was to carry out a survey on the present state of research on these questions. WHO consultants visited in 1955 over one hundred laboratories concerned with resistance problems. The study submitted in 1956 to an expert committee on insecticides revealed the gaps in our knowledge and the committee was able to draw up a plan for additional research programmes. With WHO's co-ordination members of the expert advisory panels and several scientific institutes have developed basic methods of measurement of susceptibility or resistance of vector populations. For instance, a method for testing the susceptibility of lice has been developed. The results of the tests made in many parts of the world were collated and will be published by WHO early in 1957. As a result of this work, the Organization is now in a position to give information to governments on the best methods to be used to control typhus fever in those areas where resistance has occurred as well as in those in which the insect is still susceptible. The Organization is also able to stimulate research on other insecticides to those normally used in typhus control programmes, which might be employed when complete resistance is met. An extensive system of exchange of information has been established on problems of resistance in general. This system now involves more than

300 workers in the field and makes it possible for many laboratories to plan specialized research concentrating on those questions for which they are particularly suited. There is no doubt that the cross-fertilization of ideas which resulted from the stimulation and co-ordination provided by WHO in this field will generally increase the knowledge of this vitally important problem of resistance to insecticides.

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WHO's antirabies activities highlight the primary role expert committees play in the promotion of essential research work. In 1950, an expert committee defined the many avenues which lay open for the investigation and study of problems involved in rabies prophylaxis and control in man and animals. Since none of these problems can be attacked successfully by any single institute in any country a series of co-ordinated projects was initiated, aided by small financial grants from WHO, in laboratories situated in five different countries. There were for instance field trials in Iran on the use of serum in persons seriously exposed to rabies, in Spain on the local treatment of the wounds, in Malaya and Israel on new vaccines in the control of the disease in animals, and in France and the United States of America on the standardization of potency tests of vaccines and sera. The results of these trials and of further studies carried out over the last six years were evaluated by an expert committee which met in 1956. All this cumulative research work has clarified several aspects of rabies control relating among other things to the modification of dosage schedules of vaccines and sera in prophylactic treatment after exposure, to the minimizing of side reactions to serum and vaccines and to the prior basic immunization of persons likely to be exposed to risk of bites by rabid animals. Another important step taken recently was the setting-up, in co-operation with an expert committee on biological standardization, of an international standard serum and of a reference vaccine.

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The latter achievement is part of WHO's fundamental task of providing the various branches of medical science with units of measurement which have always been a basic need for their progress. Most of the time these units can only be established by reference to standard preparations. Almost invariably the creation of such standards, whether they are for pharmaceutical preparations, for sera or for vaccines, is preceded by intensive research carried out in laboratories all over the world under the guidance of expert committees, and mainly of those responsible for biological standardization and for the preparation of the International Pharmacopoeia.

In the case of vaccines, strictly controlled field trials are often indispensable to determine the relationship between the results of laboratory tests made on animals and those expected when the vaccine is applied to man. This relationship has been successfully established for smallpox vaccine, as the result of a long series of studies initiated by WHO in 1952 and completed in 1956. These studies have also shown that it is possible to prepare a dry smallpox vaccine, stable at 45° C for a duration of at least two years. The method of production of the new vaccine has been made available by WHO and its adoption should greatly improve the prospects for the control of smallpox in hot countries. Furthermore, an expert committee on biological standardization which met in 1956 considered the vaccine sufficiently stable to warrant the establishment of an international reference standard, on which preliminary work has already begun. Similar investigations are being conducted by WHO on other vaccines in order to ensure that they can play their proper role in public-health programmes.

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Research, we have seen, is essential to WHO's effort to control and prevent the communicable diseases which still plague the major part of the world. It is also a basic factor in most of the programmes WHO has undertaken to promote world health by all those positive means which are today at the disposal of medical science.

The study of the psychobiological development of the child is, I believe, a good example of what co-ordinated research can achieve in the understanding of complex problems in the field of mental health. There exists obviously a great deal of scattered knowledge on child development, but such information remains largely within the separate compartments of scientific disciplines. It was precisely to break down the barriers between the various specialists and to stimulate inter-disciplinary research on the various aspects of the problems that the study group for the psychobiological development of the child was convened by WHO four times during the period from 1953 to 1956. These meetings were attended by experts in anthropology, psychology, psychoanalysis, electro-physiology, human biology and ethology and yielded some useful information on the biological, psychological and cultural factors influencing the development of children and of adolescents.

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The study of protein deficiency in young children provides an excellent example of inter-agency co-ordination in research work devoted to major nutritional problems. Protein deficiency disease in infants and children has been the cause of high morbidity and mortality in many countries. In the majority of cases there is no total lack of protein but rather inadequacy of protein in a form suitable for the young child, especially when milk cannot be made available. The obvious solution is of course to find methods through which the vegetable and fish sources of protein available in a given country could be used to the fullest possible extent. However, before this can be done, more must be known about certain dangers which exist in using such foodstuffs and about the means whereby their optimum value can be obtained. These problems, which concern all parts of the world, were discussed at the meeting convened in the United States of America in 1955 by FAO and WHO, with financial aid from the Josiah Macy Jr Foundation. Experts in protein nutrition met experienced workers from the United States and Europe, such as biochemists engaged in the experimental feeding of animals, scientists studying the most efficient methods of feeding stock, as well as paediatricians and general medical nutritionists.

The final decision regarding the safety and suitability of any food is a very highly specialized matter. Therefore a small advisory group, drawn from members of the WHO Expert Advisory Panel on Nutrition, was formed. This group met twice in 1956 and both meetings were attended by FAO and WHO staff members, and by representatives of UNICEF, which has a great interest in the prevention of malnutrition. A satisfactory agreement was reached on the programmes of work to be followed by the three organizations. In addition to giving technical guidance, the members of the advisory group assist individually by conducting tests in their own laboratories of different foodstuffs and by suggesting other institutes competent to do this.

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While the study of protein deficiency is still in its early stages, research undertaken on endemic goitre, another public-health problem in the field of nutrition, has already advanced to the point where the major difficulties appear to be solved. Prevention of goitre in the countries where it is still endemic depends mainly on the iodization of crude salt in use. It was first necessary to evolve a method for iodizing and in 1950, at the request of WHO, the Chilean Iodine Educational Bureau of

London undertook that work. The technique it developed established the possibility of iodizing crude salt on a very extensive scale.

After having carried out a series of investigations, the Bureau has also concluded that iodates have certain advantages over iodides, mainly because of their stability under adverse conditions of moisture, sunlight, heat and impurities in the salt. Before a recommendation could be made on the use of iodates, however, two points had to be examined, one relating to their toxicity and the other to their efficacy.

Studies in the United Kingdom and the United States of America have proved that, when given by mouth, sodium iodate has a very low toxicity. As to the problem of efficacy, tests made in the United Kingdom revealed that, taken by mouth, practically all the iodine of the iodate is available to the thyroid gland. Furthermore, controlled field experiments in Latin America definitely indicated the effectiveness of iodates in the prevention of goitre.

On the basis of the results of the studies mentioned, WHO decided to assist countries in developing the new technique of iodizing. In 1954 consultants with extensive experience in the public-health aspects of endemic goitre visited sixteen countries in Latin America. The recommendations of these consultants were accepted by each country and by 1956 most of them were taking action to provide iodized salt for their populations.

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The examples I have given show the essential place certain institutions have in the research activities promoted by WHO in acting as international centres of co-operation in the investigation of specific problems. Often this task involves undertaking difficult laboratory or epidemiological tests for countries at present unable to carry them out themselves and ensuring comparability of such tests. In other cases their function may be to classify and compare pathogens isolated all over the world so that the epidemiology of communicable diseases can be studied on a world-wide scale. Such international laboratories or centres exist for example for influenza, poliomyelitis, treponematoses, leptospirosis, brucellosis, shigella infections, biological standardization and blood grouping. The results achieved by these institutes ... testify to the increasing importance of the promotion of research to ensure the success of the programmes WHO is engaged in for the benefit of world health...

The research activities stimulated, promoted or co-ordinated by WHO illustrate the catalytic effect the Organization can have on the work carried out by national health administrations. They also show how much can be accomplished by WHO even when the staff and funds available to it are rather limited. Indeed, experience has proved that when a sound research programme is formulated, individuals and institutions are willing to co-operate in it with all the means at their disposal. As a general rule, WHO's financial help is needed only for supplies or special equipment not obtainable within a country, or for the cost of additional technical assistance when the physical burden of the work is unusually heavy. In any case this financial contribution is seldom more than a small fraction of the total cost of the programme, and immeasurably less than the value of the results to Member States.

In conclusion, it seems to be clearly established that promotion of research is one of the keystones for WHO's future work and that the success of many of our activities will depend on our ability to make a judicious use of the devices we have evolved to increase and to perfect our knowledge of the problems we have to solve in order to raise health standards throughout the world."